Overview of Draft NEI 04-01 – Guidance for COL Applicants

Public Meeting with NRC

February 2, 2005

NEI

1

Discussion Topics

- NEI 04-01 Scope, Purpose, Objective
- Overall schedule and approach
- COL application guidance overview
  - COLA requirements
  - FSAR general guidance
  - NRC reviewer guidance
  - Special topics
  - Other topics (definitions, appendices)

NEI

2

Attachment 3

NEI 04-01 Purpose and Scope

- Purpose
  - Work-in-Progress – Provide vehicle for discussing and resolving COLA issues with NRC staff (draft guideline only)
  - Provide guidance to COL applicants
  - Supplement SRP in key areas
- Scope
  - COL applications and pre-COL activities
  - Emphasis on what's new/unique about COL
  - "Base Case" licensing scenario

NEI

Objective

NRC-endorsed COLA guidance to support expected near-term license applications and NP-2010 goals

NEI

Overall schedule

- Overall schedule
  - Feb.-July 2005 – Resolve bulk of issues with NRC staff
  - August 2005 – Issue revised draft guidance (Rev. E)
  - Sept.-Nov. 2005 – Address remaining issues w/NRC
  - Dec. 2005 – Issue NEI 04-01 Rev. 0 for NRC endorsement
  - 1CYQ06 – Provisional endorsement by NRC staff (letter)
  - 2Q06 – Final Part 52 rule issued
  - 3Q06 – Issue NEI 04-01, Rev. 1, to reflect final rule

NEI

Approach

- Monthly 1.5 day public meetings thru July
- Topics set in advance to assure preparation
  - Specific issues
  - NEI 04-01 sections
- Follow-up discussions as necessary
- Exchange of letters on key points
- Roll up appropriate adjustments to NEI 04-01 COLA guidance
  - Draft Rev. E, August 2005
  - Rev. 0, December 2005

NEI

Related/Parallel Activities

- Part 52 Rulemaking
- Construction Inspection Program, especially ITAAC implementation
- Pilot ESP applications
- AP1000 design certification rulemaking
- NRC reviews of other advanced designs

NEI

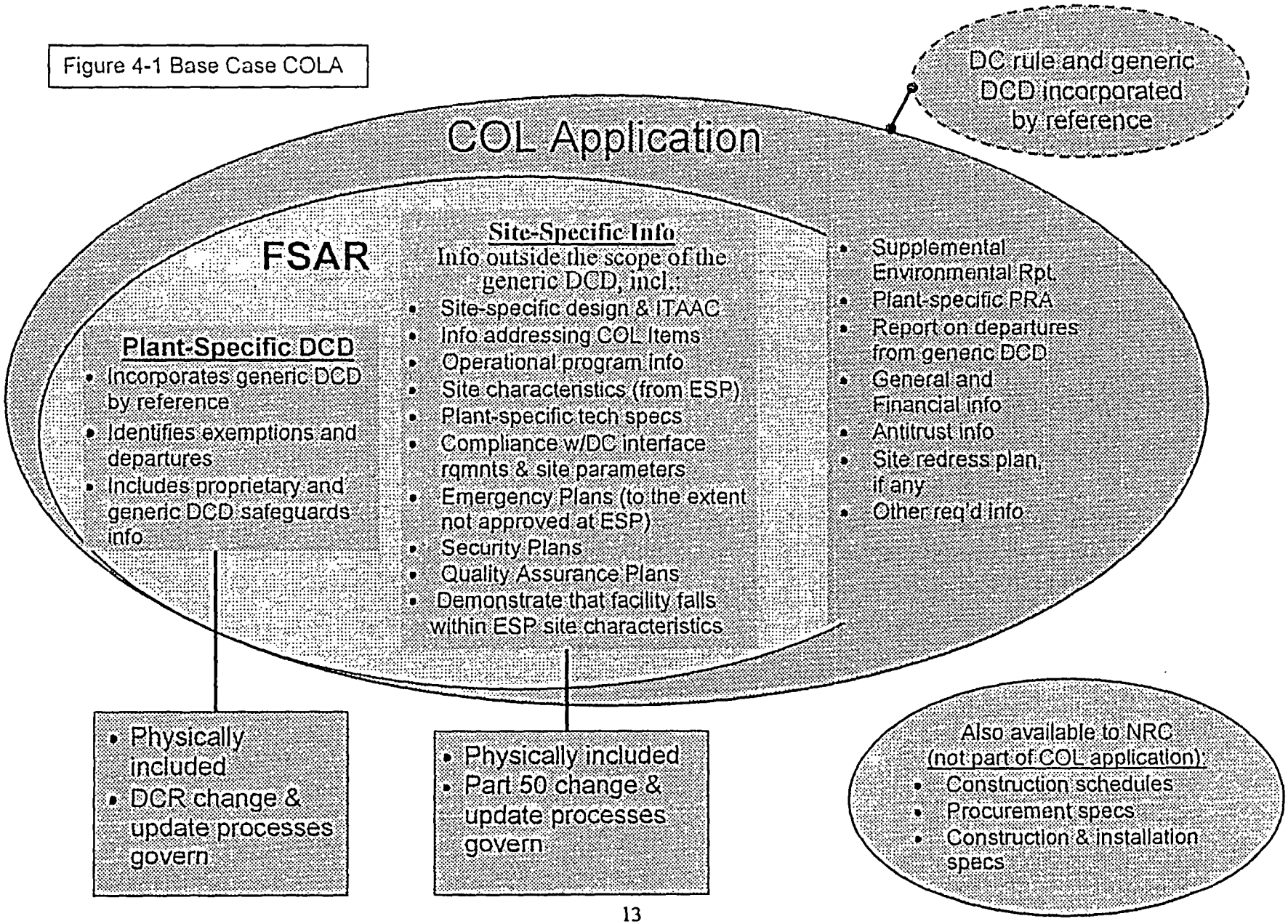
Table 4.1-1, Roadmap to Guidance on COLA Requirements

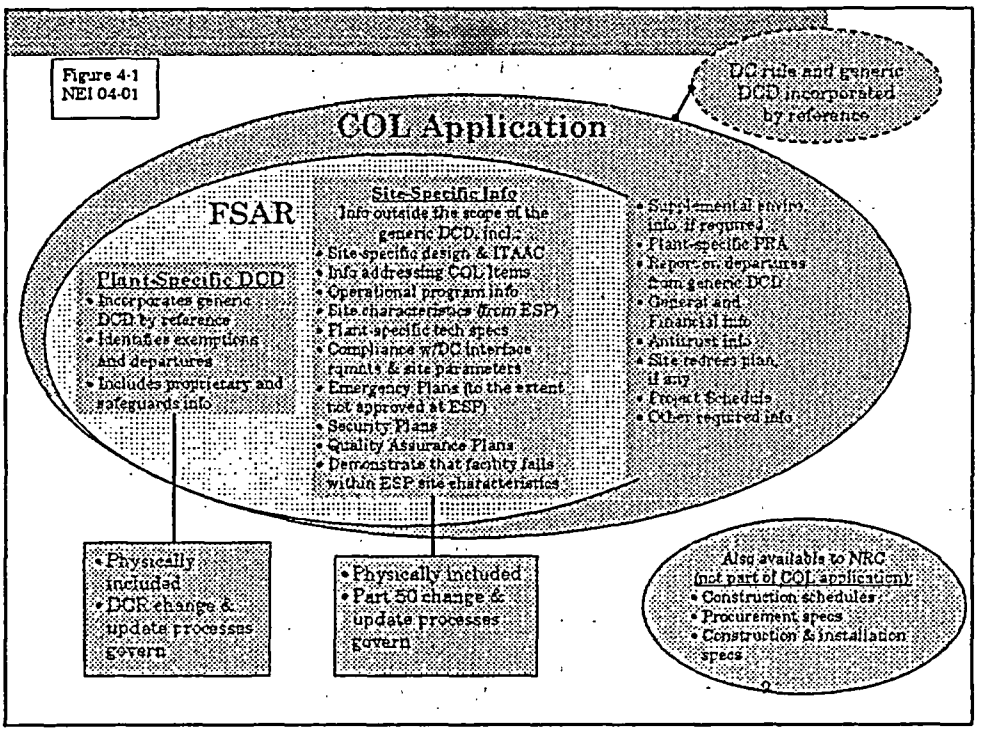
- See next page

NEI

Table 4.1-1, Roadmap to Guidance on COLA Requirements			
Part 52 Requirement		Topical Area	Addressed in NEI 04-01
52.77		General requirements	4.2.1
52.77		Financial Qualification	4.2.2
52.77		Decommissioning Funding	4.2.3
52.77		Antitrust Information	4.2.4
52.78		Training	4.3.9.13
52.79 a.1		ESP-COL Interface	4.3.9.2
52.79 a.2		No ESP Scenario	4.1.2 & 4.6
52.79 a.3		Site Redress Plans	4.7
52.79 b	50.34(a)	PSAR	N/A
	50.34(b)	FSAR	4.3.9
	50.34(c)	Security Plans	4.3.9.13
	50.34(d)	Safeguards Contingency Plans	4.3.9.13
	50.34(e)	Safeguards Information Protection	4.3.6
	50.34(f)	TMI Items	4.3.9.1.3
	50.34(g)	Combustible Gas	4.3.9.6
	50.34(h)	SRP Conformance	4.3.9.1.5
52.79 b		Compliance with site parameters and interface requirements	4.3.9.2
52.79 b		Availability for audit of certain procurement specs and construction & installation specs	4.1.1
52.79 b		No DC Scenario	4.1.2
52.79 c		COL ITAAC	4.3.9.14
52.79 d (1) or (2)		Emergency Plans	4.3.9.13
DCR.IV.A.1		Incorporate by reference the DCR	Figure 4-1
DCR.IV.A.2.a		Plant specific DCD	4.3.2
DCR.IV.A.2.b		Report on departures from generic DCD	4.5
DCR.IV.A.2.c		Plant specific Tech. Specs	4.3.9.16
DCR.IV.A.2.d		Compliance with DCD site parameters and interface requirements	4.3.9.2 (site parameters) 4.3.3 (interfaces)
DCR.IV.A.2.e		Address COL items	4.3.9
DCR.IV.A.2.f		Other information required by 50.47 (a) (e.g. USIs/GSIs)	4.3.9.1
DCR.IV.A.3		Include proprietary and safeguards information in plant specific DCD	4.3.9

Figure 4-1 Base Case COLA





Section 4.3.8, Scope of NRC Review for Base-Case COL Applications

- See next page

4.3.8 NRC Review of FSAR Information for Base Case COL Applications

As described above, a COL application that references a design certification and an ESP will contain substantial information that is considered resolved as provided by 10 CFR 52.63 and 10 CFR 52.39. These sections provide for the finality of design certification and ESP information unless a modification is necessary for compliance with NRC regulations in effect at the time the certification/permit was issued, or to assure the adequate protection of the public health and safety or common defense and security. Thus, previously approved design certification and ESP information is not subject to further NRC review or public hearing in the COL proceeding. Table 4.3.8-1, below, summarizes the resolution status of various information within a COL application that references a design certification and ESP:

Table 4.3.8-1

Matters considered resolved and <u>not</u> subject to NRC review or public hearing in a COL proceeding.	**Matters considered unresolved and subject to NRC review and public hearing in a COL proceeding.**
<u>If a design certification is referenced:</u> • Issues resolved in connection with the design certification proceeding as identified in Section VI of the design certification rules, including the Tier 1/ITAAC and Tier 2 information approved in the generic DCD • Properly implemented plant-specific departures from Tier 2 of a referenced generic DCD. (These are considered within the envelope of the original safety finding on the standard plant design.)	• Required COL application information beyond the scope of a referenced design certification • Exemptions from Tier 1, Tier 2 or Tier 2* requirements of a generic DCD • Departures from Tier 2* information • Departures from Tier 2 that require prior NRC approval under 10 CFR 50.90
<u>If an ESP is referenced:</u> • Site safety, environmental and emergency preparedness issues resolved in connection with a referenced ESP	• Information necessary to satisfy (or justify deviations from) terms and conditions of the ESP • Significant environmental issues with respect to the site not considered in a previous proceeding • Variances from the ESP sought by the COL applicant

General and Financial Requirements

4.2.1 – Filing Requirements and NRC Review Fees
4.2.2 – General Information
4.2.3 – Decommissioning Funding Assurance*
4.2.4 – Antitrust Requirements*

* Legislative changes under consideration

NEI

Safety Analysis Report – General Guidance

4.3.1 – Regulatory Requirements (50.34(b))
4.3.2 – FSAR = Plant-Specific DCD + Site-Specific Information
4.3.3 – Interface Requirements
4.3.4 – COL Items
4.3.5 – Level of Detail
4.3.6 – Proprietary and Safeguards Info
4.3.7 – Treatment of Generic DCD Conceptual Info
4.3.8 – NRC Review for Base Case COLAs
4.3.9 – Chapter-by-Chapter FSAR guidance

NEI

Regulatory Requirements

Pending Part 52 rule changes may affect COLA guidance:

NEI 04-01
Section

- 4.3.1 – COLA content requirements
- 4.3.9.2 – Site "characteristics" vs. "parameters"
- 4.3.9.13.3 – Training Program requirements
- 4.3.9.14.3 – ITAAC expiration
- 4.3.9.14.4 – Completing ITAAC at COL
- 4.4.2 – Plant-specific PRA
- 4.5/5.4.2 – Report on departures from DCD
- 6.0 – Proposed vendor change process
- 6.2.2.1 – 50.59 conforming changes

NEI

Section 4.3.1.1, Current COLA Content Requirements and Proposed Changes

- See next page

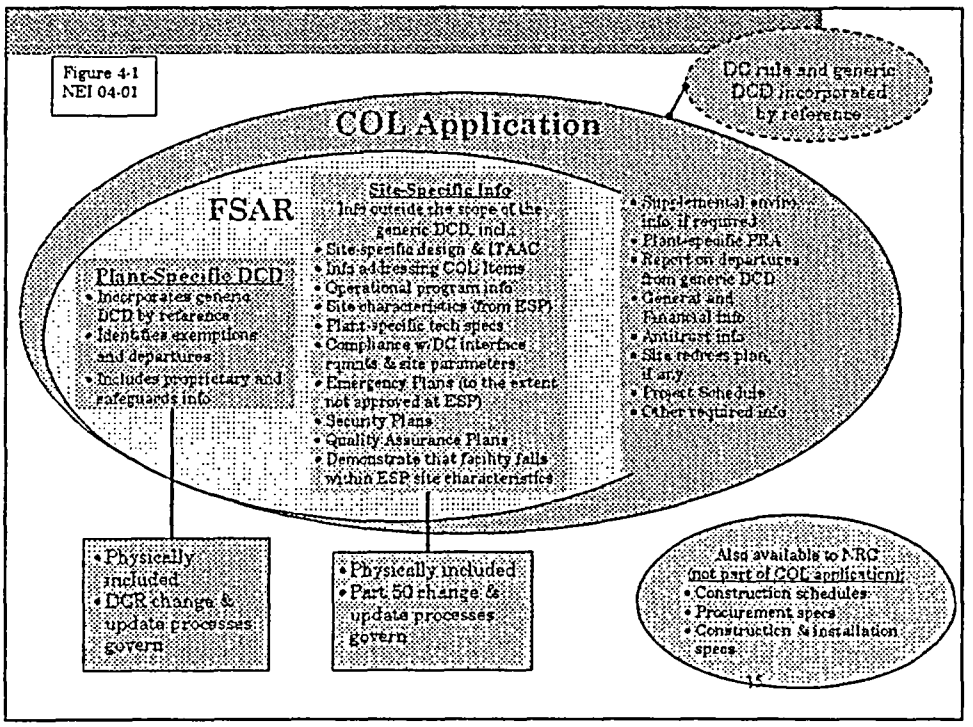
NEI

certification. This information will be provided in the site-specific portion of the FSAR as described in Section 4.3.2.

4.3.1.1 Current Requirements and Proposed Changes

The current requirements of 10 CFR 52.79(b) are identified below together with the clarified (and reorganized) requirements proposed in the July 3, 2003, Notice of Proposed Rulemaking on Part 52. Redlining indicates the industry comments on the changes proposed by the NRC staff. The final rule will reflect the NRC staff disposition of the redlined industry comments.

Current Part 52 Requirement	July 2003 NRC-Proposed Changes (With Redlined Industry Comments)
Section 52.79(b) The application must contain the technically relevant information required of applicants for an operating license by 10 CFR 50.34. The final safety analysis report and other required information may incorporate by reference the final safety analysis report for a certified standard design. In particular, an application referencing a certified design must describe those portions of the design which are site specific, such as the service water intake structure and the ultimate heat sink. An application referencing a certified design must also demonstrate compliance with the interface requirements established for the design under § 52.47(a)(1), and have available for audit procurement specifications and construction and installation specifications in accordance with § 52.47(a)(2).	(b) The application must contain the technically relevant information required of applicants for an operating license by 10 CFR 50.34 ~~in a final safety analysis report~~. (b)(4) An application referencing a certified design must satisfy the additional requirements in Section IV.A of that rule. ~~include in the final safety analysis report the information approved for incorporation by reference in a design certification rule;~~ The final safety analysis report must include a site-specific portion that describes those portions of the design that are not described in the certified design, such as the service water intake structure and the ultimate heat sink,~~;~~ and demonstrates compliance with the interface requirements established for the design under § 52.107(a)(1).~~; and have available for audit procurement specifications and construction and installation specifications in accordance with §§ 52.107(a)(2) and 52.203(b).~~ (c) The applicant shall have available for audit procurement specifications and construction and installation specifications in accordance with §§ 52.107(a)(2) and 52.203(b).



FSAR and Plant-Specific DCD

- FSAR = PSDCD + Site-Specific Info
- FSAR structure envisioned by the Commission in the May 12, 1997, Statements of Consideration for the ABWR design certification final rule:

"The Commission expects that the plant-specific DCD will become the plant's final safety analysis report (FSAR), by including within its pages, at the appropriate points, information such as site-specific information for the portions of the plant outside the scope of the referenced design, including related ITAAC, and other matters required to be included in an FSAR by 10 CFR 50.34. Integration of the plant-specific DCD and remaining site-specific information into the plant's FSAR, will result in an application that is easier to use and should minimize "duplicate documentation" and the attendant possibility for confusion."

NEI

APPENDIX E

COLA FORMAT EXAMPLE
SECTION 8.2

Attached is an example of the format for a COLA section that references the AP1000 DCD. Section 8.2, "Offsite Power Systems" was chosen since it includes the information required to address COL Information Items, Interfaces and conceptual design information. A fictional plant design, AP1000-1, was chosen for the example. The site-specific information for the transmission system and switchyard was developed based on a typical, current FSAR description and analysis and should be typical of the scope of information required for a COLA.

Hyperlinks to the appropriate generic DCD section (Tier 2) are used in the COLA text. This method is intended to address the requirement of 10 CFR Part 52, DCR IV.A.2.a, for a COL applicant referencing the AP1000 DCD. Subsections of 8.2 are addressed individually with a statement that either confirms that all information in the corresponding DCD section is applicable or identifies any departures. In the attached Section 8.2.1.2, a departure from the AP1000 is identified by bold text.

COL Information items and Interfaces listed in Tables 1.8-1 and 1.8-2 of the AP1000 DCD are addressed in the attached. A table in COLA section 1.8 will provide a cross-reference to the COLA section where each of these is addressed. For example, COL Information Item 8.2-1 is addressed in the attached Section 8.2.1, 4th paragraph, and that would be identified in the COLA Section 1.8 Table. This table would also provide a reference for the conceptual design information verification and plant parameters verification.

EXAMPLE COLA FSAR SECTION 8.2

Plant AP1000-1

8.2, "Offsite Power System"

8.2.1 System Description

The system description in Section 8.2.1 of the AP1000 DCD, Revision 14 is applicable to the AP1000-1 Plant and incorporated by reference without exception.

The Owner Utility Company (OUC) system supplies the offsite ac power required for start-up, normal operation and safe shutdown of AP1000-1. The offsite power sources to the 345-kV plant switchyard consist of a transmission line with two 345-kV circuits from the YYY Substation 18 miles northwest of the plant and another transmission line with two 345-kV circuits from the ZZ substation approximately 22 miles south of the plant. The offsite transmission system is shown in Figure 8.2-1 and is 100% owned by OUC. The termination schemes for the two circuits at YYY Substation and the two circuits at ZZ Substation are shown in Figures 8.2-2 and 8.2-3. These figures also show the integration of the two lines into the interconnected system. This arrangement provides two physically separated offsite transmission lines comprised of four 345-kV circuits. The closest proximity of the two lines occurs at the point where they attach to the switchyard arbors and is approximately 150 feet.

Maintenance power for the plant is provided from a separate, 13.8 kV circuit from the BB substation to the plant switchyard. This circuit is designed to supply all maintenance loads during plant shutdown. As discussed in the AP1000 DCD, Section 8.2.1, maintenance power is provided at 6.9 kV through a reserve auxiliary transformer in the Transformer Area approximately 50 feet from the Turbine Building as shown in Figure 8.2-4. The stepup transformers and unit auxiliary transformers are also located in the Transformer Area.

The YYY and ZZ substations are part of the OUC system as described in Section 8.1. The 345 kV circuits are installed on double-circuit steel tower structures. The lines from the station switchyard to the YYY and ZZ substations are located on 200-foot right-of-ways. Geographical features of the right-of-ways and the intersections with other transmission lines are shown on Figure 8.2-1. The 345 kV lines cross above the lower voltage lines along the right-of-ways. The transmission lines and their associated structures are designed in accordance with OUC standards and in accordance with ANSI C2-1997, "National Electrical Safety Code". The system is designed to successfully withstand the loading requirements for environmental conditions prevalent in the area related to terrain, soils, wind, temperature, lightning and floods to minimize the possibility of failure. The two offsite power circuits are fully testable. Since they are continuously

energized, they are continuously tested by their use. When an individual circuit is shutdown for maintenance, relays, meters, and other instruments can be tested and calibrated as required. The transmission lines are routinely visually inspected in accordance with OUC procedures.

Offsite system technical requirements are determined by an agreement between plant management and OUC transmission system operations. The agreement covers requirements for communication of system maintenance and operational abnormalities. It also sets the requirements for system nominal voltage, allowable voltage regulation, nominal frequency, allowable frequency fluctuation, maximum frequency decay rate, and voltage operating range. The required values per the agreement are shown in Table 8.2-1 along with the expected values of steady-state load to be supplied by the grid and the expected value of inrush kVA for motors.

8.2.1.1 Transmission Switchyard

The 345-kV AP1000-1 switchyard consists of circuit breakers, disconnect switches, busses, transformers and associated equipment. The switchyard is arranged in a modified breaker-and-a-half configuration as shown in Figure 8.2-5.

A 345/13.8-kV Support Transformer is connected directly to each 345-kV bus through a disconnect switch which is capable of interrupting magnetizing current. The Support Transformers are three-winding transformers rated at 60/80/100 MVA. Each transformer has two low side breakers connected so that either transformer may supply via underground duct a 13.8/6.9 kV Unit Auxiliary Transformer in the Transformer Area.

Another offsite supply consists of a 13.8 kV maintenance supply through the switchyard to the Reserve Auxiliary Transformer in the Transformer Area. The connections from the Unit Auxiliary Transformers and Reserve Auxiliary Transformer to station busses is discussed in Section 8.3.

The switchyard has been designed in accordance with the following industry standards:

1) Institute of Electrical and Electronics Engineers, Inc. (IEEE)
2) American National Standards Institute (ANSI)
3) National Electrical Manufacturers Association (NEMA)
4) American Society for Testing and Materials (ASTM)
5) National Electric Safety Code (NESC)

As discussed in the AP1000 DCD, Section 8.1.4.1, offsite power has no safety-related function. Offsite power redundancy is provided to assure a reliable offsite system for delivery of power generated at the station and to minimize challenges to passive safety systems.

8.2.1.2 Transformer Area

The information in Section 8.2.1.2 of the AP1000 DCD, Revision 14, is applicable to the AP1000-1 Plant and incorporated by reference with one exception. **DCD section 8.2.1.2 states that protective relaying and metering for the transformer area is located in the turbine building. The transformer area for AP1000-1 will include a control building which will house some of the protective relaying for equipment in the area.**

8.2.2 Grid Stability

The information in Section 8.2.2 of the AP1000 DCD, is applicable to the AP1000-1 Plant and incorporated by reference without exception.

Although an exemption to 10 CFR 50, Appendix A, GDC 17 is justified as discussed in the generic DCD, Section 8.2.3, system reliability considerations result in many of the same system characteristics of a system designed to meet that criterion. Some of those characteristics are:

1) Any one of the 345-kV transmission circuits is capable of carrying the auxiliary load.
2) The 345-kV system is protected from lightning and switching surges by lightning-protective equipment and by overhead static lines.
3) The design of the 125-volt dc system for the switchyard provides for two independent dc systems. Each of the two systems consists of a separate 125-volt dc battery, a battery charger, and a distribution system. Cable separation is maintained between the two systems from the batteries to the distribution cabinets. A single failure caused by a malfunction of either of the two 125-volt dc systems will not affect the performance of the other system. The ability of the switchyard to supply offsite power to the plant will not be affected by the complete loss of either of the two 125-volt dc systems. The 125-volt systems are continuously monitored in the control room.
4) Alarm windows are provided in the control room for ac or dc supply trouble, switchyard annunciator trouble, loss of carrier signal on either 345 kV circuit, unit auxiliary transformer trouble, 345 kV breaker opening, and 345 kV bus protection trips. Remote indication of 345 kV bus voltage and frequency is also provided in the load dispatch control room of OUC.
5) For reliability and operating flexibility, the substation design (YYY, ZZ and AP1000-1) is a breaker-and-a-half arrangement, with breaker failure backup protection. This design permits the following:

    a) Any transmission line can be cleared under normal or fault conditions without affecting any other transmission line,

b) Any circuit breaker can be isolated for maintenance without interrupting the power or protection to any circuit, and
c) Short circuits on a section of bus will be isolated without interrupting service to any items of equipment other than those connected to the faulted bus section.

Load flow and transient stability analyses demonstrate the ability of the grid to provide uninterrupted synchronous alternating current to the 345-kV Plant Site Switchyard for the following conditions:

1) With any one of the 345-kV transmission circuits out of service, a sustained three-phase fault on any other 345-kV circuit cleared in primary clearing time of .05 seconds,
2) A sustained three-phase fault occurring simultaneously on both circuits of a double-circuit 345-kV transmission line between the plant switchyard and the OUC system cleared in primary time of .05 seconds,
3) A sustained three-phase fault on any one of the 345-kV transmission circuits between the plant switchyard and the OUC grid cleared in the breaker failure back up clearing time of 0.175 seconds.

The preliminary load flow and transient stability studies performed show that the projected interconnected system is stable and 345-kV power is available to the onsite system after a plant trip. Results of the preliminary analysis are shown in Table 8.2-2. Final grid stability calculations will be performed prior to fuel load. A criterion of the AP1000 design is that the grid will remain stable and the reactor coolant pump bus voltage will remain above the voltage required to maintain the reactor coolant flow assumed in the Chapter 15 analyses for a minimum 3 seconds following a turbine trip. Instrument setpoint criteria for breaker protective devices are based on this criterion. The DCD criterion is shown to be met in the preliminary analysis. {COL Interface Item 8.3}

Interconnection of the two 345-kV supplies to the grid is shown on Figure 8.2-1. The interconnected system is operated in accordance with reliability criteria specified by the interconnected system operator. Any changes to operation of the system are communicated to OUC and plant management. Changes are reviewed for compliance with the management agreement discussed above. Based on historical operation of the systems, the criteria for reliability identified in this section will be met.

8.2.3 Conformance to Criteria

The information in AP1000, Revision 14, Section 8.2.3, is applicable to the Offsite Power System for the AP1000-1 Plant and incorporated by reference without exception.

8.2.4 Standards and Guides

The information in the AP1000, Revision 14, Section 8.2.4, is applicable to the AP1000-1 Plant and incorporated by reference without exception.

8.2.5 Combined License Information for Offsite Electrical Power

COL Item 8.2-1 on the design of the AC power transmission system and its testing and inspectin plan are addressed in Section 8.2.1.

COL Item 8.2-2 on technical interfaces of the off-site power system with the standard plant are addressed in Section 8.2.2.

8.2.6 References

The information in AP1000, Revision 14, Section 8.2.6, is applicable to the AP1000-1 Plant and incorporated by reference without exception.

FSAR Chapter 1

- Organized per RG 1.70 and referenced DCD
- Updated tables in Section 1.8 will identify the FSAR location where interfaces and COL Items are addressed (including any COL items from the ESP)
- Section 1.9 will contain updated info on:
  - USI/GSIs
  - NRC Generic Communications
  - Reg. Guide conformance
  - TMI Items (those not closed at design certification)
  - SRP conformance

NEI

FSAR Chapter-by-Chapter Guidance

- See next page

NEI

Excerpt from Table 4.3.9.3-1

Item No.	COL Item or Other	PSDCD Section	DESCRIPTION	Ref.	Compl. Timing	Related FSER Item	Related Interface	Comments
3-5	3.6-2	3.6.3.4	Combined License applicants referencing the AP 1000 certified design will complete the leak-before-break evaluation by comparing the results of the as-designed piping stress analysis with the bounding analysis curves documented in Appendix 3B. The Combined License applicant may perform leak-before-break evaluation for a specific location and loading for cases not covered by the bounding analysis curves The leak-before-break evaluation will be documented in a leak-before-break evaluation report.	SRP 3.6.3 and attachments and ANSI 58.2 dated 1988	COLA	3.6.3.1-2	N/A	
3-6	3.6-3	3.6.3.4	Combined License applicants referencing the AP1000 certified design will address: 1) verification that the as-built stresses, diameter, wall thickness, material, welding process, pressure, and temperature in the piping excluded from consideration of the dynamic effects of pipe break are bounded by the leak-before-break bounding analysis; 2) a review of the Certified Material Test Reports or Certifications from the	SRP 3.6.3 and attachments and ANSI 58.2 dated 1988	Fuel Load	3.6.3.1-1	N/A	

APPENDIX F
AP1000 COLA OUTLINE – SAMPLE EXCERPT

The Westinghouse AP1000 Generic DCD was reviewed as a first step in identifying the scope of work for development of a COLA referencing this certified design. The NEI COLTF designed an Excel spreadsheet format for use by several contractors in developing "COLA Guidance Outlines". The outlines follow the section numbering and format of the generic DCD and identify a proposed location for COL Information items, interfaces and other required information. They also provide for identification of regulatory references, submittal timing, and miscellaneous comments. Attachment F-1 is a sample of an outline spreadsheet for Section 3.6.3 and Attachment F-2 is the procedure for developing the COLA Guidance Outlines and defines their contents. The Section 3.6.3 spreadsheet includes examples of subsections that are fully described in the generic DCD (3.6.3.1 through 3.6.3.3) (i.e., "None" in Column 2 means no additional COL applicant information is required) and a subsection that requires COL application information as defined by COL Information items (Section 3.6.3.4). In a future revision of NEI 04-01, the COLA Guidance Outlines for AP1000 and ABWR will be provided in this Appendix (on compact disc).

Section 4.3.9 of this report describes the work scope for a COL application referencing the AP1000 certified design. A series of tables in sections 4.3.9.1 through 4.3.9.17 of NEI 04-01 describe specific FSAR sections that are the responsibility of the COL applicant. For example, NEI 04-01, Table 4.3.9.3-1, corresponds to the sample COLA outline spreadsheet provided in this appendix. Note that Table 4.3.9.3-1 does not include entries for subsections 3.6.3.1 through 3.6.3.3 (because no additional COL applicant information is required for those sections), but includes Item 3-5 for COL Information item 3.6-2 which will be addressed in COLA section 3.6.3.4. The information for item 3-5 is derived from COLA spreadsheet 3.6.3.

The purpose of the spreadsheets is to provide a complete outline of the site-specific DCD including references to the generic DCD. In contrast, Tables 4.3.9.1-1 through 4.3.9.17-1 are intended to highlight the COL sections that require COL applicant input.

ATTACHMENT F-1, EXAMPLE COLA GUIDANCE SPREADSHEET

Standard Format for COLA Outlines

Standard Format for COL Application Section Outline Deliverables

		COL Applicant Scope of Info (Supplements approved DCD info)		(4) Engineering inputs or other resources necessary to develop COL application	Recommended timing and mechanism for closure of COL Item			(8) Remarks, e.g., additional COL applicant scope SRP Review Areas, Tech Spec Bases consideration, etc.
(1) AP 1000 Chapter 3, Design of Structures, Components, Equipment and Systems Section Number	Title	(2) Interface requirement or COL Item (Identify corresponding ITAAC, if any)	(3) Codes, Standards, Reg. Guides, etc. related to COL Scope		(5) Closure Time Frame (COL submittal, fuel load, or startup)	(6) Corresponding SRP Section, if any	(7) Recommended closure mechanism	
3.6.3	Leak-Before-Break Evaluation Procedures	None	N.A.	N.A.	N.A.	N.A.	N.A.	
3.6.3.1	Application of Mechanistic Pipe Break Criteria	None	N.A.	N.A.	N.A.	N.A.	N.A.	
3.6.3.2	Design Criteria for Leak-before-Break	None	N.A.	N A.	N.A.	N.A.	N.A.	

		COL Applicant Scope of Info (Supplements approved DCD info)		(4) Engineering inputs or other resources necessary to develop COL application	Recommended timing and mechanism for closure of COL Item			(8) Remarks, e.g., additional COL applicant scope SRP Review Areas, Tech Spec Bases consideration, etc.
(1) AP 1000 Chapter 3, Design of Structures, Components, Equipment and Systems Section Number	Title	(2) Interface requirement or COL Item (Identify corresponding ITAAC, if any)	(3) Codes, Standards, Reg. Guides, etc. related to COL Scope		(5) Closure Time Frame (COL submittal, fuel load, or startup)	(6) Corresponding SRP Section, if any	(7) Recommended closure mechanism	
3.6.3.3	Analysis Methods and Criteria	None	N.A.	N.A.	N.A.	N.A.	N.A.	
3.6.3.4	Documentation of Leak-before-Break Evaluations	COL Info Item 3.6.-2: Combined License applicants referencing the AP 1000 certified design will complete the leak-before-break evaluation by comparing the results of the as-designed piping stress analysis with the bounding analysis curves documented in Appendix 3B. The Combined License applicant may perform leak-before-break evaluation for a specific location and loading for cases not covered by the bounding analysis curves The leak-before-break evaluation will be documented in a leak-before-break evaluation report.	SRP 3.6.3 and attachments and ANSI 58.2 dated 1988	LBB analysis must be completed	COLA	See Column (3)	Analysis	

		COL Applicant Scope of Info (Supplements approved DCD info)		(4) Engineering inputs or other resources necessary to develop COL application	Recommended timing and mechanism for closure of COL Item			(8) Remarks, e.g., additional COL applicant scope SRP Review Areas, Tech Spec Bases consideration, etc.
(1) AP 1000 Chapter 3, Design of Structures, Components, Equipment and Systems Section Number	Title	(2) Interface requirement or COL Item (Identify corresponding ITAAC, if any)	(3) Codes, Standards, Reg. Guides, etc. related to COL Scope		(5) Closure Time Frame (COL submittal, fuel load, or startup)	(6) Corresponding SRP Section, if any	(7) Recommended closure mechanism	
3.6.3.4	Documentation of Leak-before-Break Evaluations (continued)	COL Info Item 3.6-3: Combined License applicants referencing the AP1000 certified design will address: 1) verification that the as-built stresses, diameter, wall thickness, material, welding process, pressure, and temperature in the piping excluded from consideration of the dynamic effects of pipe break are bounded by the leak-before-break bounding analysis; 2) a review of the Certified Material Test Reports or Certifications from the Material Manufacturer to verify that the ASME Code, Section III strength and Charpy toughness requirements are satisfied; and 3) complete the leak-before-break evaluation by comparing the results of the final piping stress analysis with the bounding analysis curves documented in Appendix 3B. The leak-before-break evaluation will be documented in a leak-before-break evaluation report.	SRP 3.6.3 and attachments and ANSI 58.2 dated 1988	LBB analysis must be completed	Fuel Load	See Column (3)	Analysis	

		COL Applicant Scope of Info (Supplements approved DCD info)		(4) Engineering inputs or other resources necessary to develop COL application	Recommended timing and mechanism for closure of COL Item			(8) Remarks, e.g., additional COL applicant scope SRP Review Areas, Tech Spec Bases consideration, etc.
(1) AP 1000 Chapter 3, Design of Structures, Components, Equipment and Systems Section Number	Title	(2) Interface requirement or COL Item (Identify corresponding ITAAC, if any)	(3) Codes, Standards, Reg. Guides, etc. related to COL Scope		(5) Closure Time Frame (COL submittal, fuel load, or startup)	(6) Corresponding SRP Section, if any	(7) Recommended closure mechanism	
3.6.3.4	Documentation of Leak-before-Break Evaluations (continued)	COL Info Item 3.6-4: Combined License applicants referencing the AP1000 certified design will develop an inspection program for piping systems qualified for leak-before-break. The inspection program will consider the operating experience of the materials used in the AP1000 piping systems qualified for leak-before-break, and will include augmented inspection plans and evaluation criteria consistent with those measures imposed on or adopted by operating PWRs as part of the ongoing resolution of concerns regarding the potential for PWSCC in operating ploants. The AP1000 inspection program will be consistent with the inspection program adopted for operating PWRs that use Alloy 690, 52, and 152 in approved leak-before-break applications.	SRP 3.6.3 and attachments and ANSI 58.2 dated 1988	Description of the inspection plan to be developed	COLA	See Column (3)	Inspection plan to be finalized prior to fuel load	

Table notes
"None" in Column 2 means generic DCD contains all necessary and sufficient info for that section. COL applicant is responsible for verifying the validity of generic DCD info and identifying

Addressing SRP Conformance

- Required by 10 CFR 50.34(h); conformance to be assessed against latest approved SRP
- COLAs will focus on SRP review areas and criteria not previously addressed for design certification or ESP
  - Because the design certification and ESP have finality, it is not necessary for the COLA to address conformance to the SRP for those matters that were previously approved
- COL applicants and NRC will consider Reg. Guides, SERs and other approved guidance issued since the SRP was last updated
- COLA experience should be incorporated into the SRP in a future update
- Leverage NEI 04-01 in key areas where lack of SRP guidance is a concern, e.g., Chapter 19 (PRA Info)

NEI

Special COLA Topics

- COL-2b, ESP-COL interface (4.3.9.2, 4.6, 6.4.1/2)
- COL-2a, Operational Programs (4.3.9.13)
- COL-2d, Site-specific design ITAAC (4.3.9.14.3)
- COL-2i, Plant-specific tech specs (4.3.9.16)
- COL-2k, Quality Assurance and Reliability Assurance (4.3.9.17)
- COL-2g, Human Factors Engineering (4.3.9.18)
- COL-2f, PRA Information (4.3.9.19) and Plant-Specific PRA Update (4.4)

NEI

ESP-COL Interface Issues

COLA guidance provided on satisfying the following:

Requirement	Addressed in
Demonstrate the facility falls within the site *characteristics* (§52.79(a)(1))	FSAR Chapter 2 – NEI 04-01 Section 4.3.9.2.2
Demonstrate compliance with design certification interface requirements and site parameters (DCR §IV.A.d)	FSAR Chapter 2 – NEI 04-01 Section 4.3.9.2.3
Address siting-related COL Items (DCR §IV.A.e)	FSAR Chapter 2 – NEI 04-01 Section 4.3.9.2.4
Comply with ESP terms and conditions (proposed in 2003 NOPR)	FSAR Chapter 2 or separate COLA document – NEI 04-01 Section 4.3.9.2.5
Resolve any significant environmental issue not previously considered, i.e., deferred or new issues (§52.79(a)(1))	Supplemental ER – NEI 04-01 Section 4.6

NEI

Treatment of Operational Programs

NEI 04-01, Section 4.3.9.13

- Scope of programs to be described in the FSAR will be consistent with NRC FSAR content regulations, the SRP and RG 1.70, Rev. 3
- Descriptions of other required programs to be maintained on site
- Programs to be described at a functional level consistent with May 14, 2004, Commission SRM on PITAAC
  - Equivalent in substance to that provided in FSARs for recent OLs, including description of how programs conform or will conform with NRC requirements, the SRP and applicable regulatory guidance
  - Including information on the timing of program implementation
- Example Health Physics Program description provided in NEI 04-01, Section 4.3.9.12

NEI

Site-Specific Design Info and ITAAC
NEI 04-01, Section 4.3.9.14

- COLA FSAR will provide site-specific design info beyond the scope of a referenced design certification
- Total scope of COLA design info (standard plus site-specific) will be consistent with SRP and recent FSARs
- Level of detail for site-specific design information will be consistent with
  - generic DCD (e.g., commensurate with safety significance)
  - analogous information approved by the NRC for current FSARs
- Site-specific design ITAAC will
  - look like analogous design certification ITAAC
  - be consistent with ITAAC general principles, e.g., focus on salient design and performance criteria

NEI

Site-Specific Design ITAAC

- Scope – Correspond to implementing provisions for Tier 1 interface requirements, if any
  - ABWR has Tier 1 interface requirements
  - AP1000 does not
- Content –
  - Analogous to design certification ITAAC
  - Based on safety significance consistent with criteria in Section 14.3 of the referenced generic DCD

NEI

AP1000 Case

- COLA FSAR Section 14.3 would include a table of all COL ITAAC
  - ITAAC from the generic DCD
  - ITAAC for emergency planning
- The table of COL ITAAC for AP1000 would identify additional site-specific systems related to operation of the plant
  - E.g., Circulating Water System, but not warehouse facilities
  - Because there are no Tier 1 interface requirements, there would be no ITAAC entries for these additional systems

NEI

Plant-Specific Tech Specs (PSTS)
NEI 04-01, Section 4.3.9.16

- Use of single exemption request to process non-bracketed departures from PSTS. See DCR §VIII.C.4
  - Bracketed information is treated as "conceptual design information"
  - Examples of expected departures:
    - System setpoints [when not bracketed]
    - Risk-informed improvements such as TSTF-358 re: missed surveillances
    - Review items not assumed in DBA per 50.36 criteria, e.g., AP1000 generic TS 3.9.6 on containment air filtration
    - Other updates such as:
      - §50.59 rule change (ABWR GTS 5.4.2),
      - Complete rewrite of Section 5 (Admin Controls)
      - Other Writer's Guide nonconformances
  - Who tracks the "generic departures" from generic TS for consistency/inclusion in future applications? See DCR §VIII.C.2
  - Some aspects of PSTS to be completed post-COL, e.g., instrumentation setpoints in ITS Section 3.3
  - Related documents to be completed post-COL, e.g., PTLR (ITS 5.6.6), ODCM (ITS 5.6.5), and COLR (ITS 5.5.1)

NEI

QA and Reliability Assurance

NEI 04-01, Section 4.3.9.17

- COL applicant will implement Design RAP to support detailed engineering and procurement
- Licensee programs, e.g., QA, Maintenance and Configuration Control, will constitute ORAP, consistent with draft SRP 17.4

NEI

COLA Guidance for HFE

NEI 04-01, Section 4.3.9.18

- AP1000 example as basis
- Cover 12 elements of NUREG-0711
- Place in 3 categories of closure timing vs. COLA
- Target ITAAC (DAC) that can be completed prior to COL issuance
- Develop methods, tools, results to support closure (e.g., Task Analysis)
- Reduce licensing uncertainty

NEI

Expectations for 12 Elements

- Closed in Design Cert:
  - HFE Program Plan
  - Operating Experience Review
  - Functional Requirements Analysis/Allocation
- Close-able at COLA:
  - Task Analysis
  - Staffing Analysis
  - Human Reliability Analysis
  - Procedure Development
  - Training Program Development
  - Human Performance Monitoring Program

NEI

Expectation for 12 Elements (cont.)

- Post-COL closure
  - Human-system Interface Design
  - Human Factors Verification & Validation
  - Design Implementation (issue closure)
- NEI 04-01 provides guidance on:
  - Form and content of Ch. 18 info
  - Addressing HFE-related COL Items
  - Completion of ITAAC at COL (in Section 4.3.9.14.4)

NEI

FSAR Chapter 19, "PRA Information"

NEI 04-01, Section 4.3.9.19

- Standard format proposed for FSAR Chapter 19
  - Appropriate to the COL context
  - Facilitate consistent NRC review
  - Generic DCD Ch. 19 available w/ COLA
  - Would require exemption from current regs
- Ch. 19 COL Items (5 for AP1000) to be addressed based on info available at time of COLA, e.g., design/construction info vs. as-builts

NEI

Proposed FSAR Chapter 19 Format and Content

- 19.1 Introduction
  - 19.1.1 Objectives
  - 19.1.2 Format and Content of Section 19
- 19.2 Scope and Approach to development of plant-specific PRA
  - 19.2.1 Scope
  - 19.2.2 Approach
- 19.3 Information addressing COL Items
- 19.4 PRA Results
  - 19.4.1 – Reference to design PRA results
  - 19.4.2/19.4.3 – Assessment of plant-specific design differences versus design PRA results
  - 19.4.4 – Insights from plant-specific PRA (when completed)
- 19.5 Support of plant programs, e.g. for D-RAP, MR, Tech Specs, HFE, etc.
- 19.6 References

NEI

AP1000 Chapter 19 COL Items

1. Baseline vs. as-built PRA Review
2. As-Built SSC HCLPF Comparison to Seismic Margin Evaluation
3. Internal Fire and Flood Analyses Comparison
4. Develop and Implement SAMGs
5. Equipment Survivability (thermal lag assessment)

NEI

Plant-Specific PRA

NEI 04-01, Section 4.4

- Plant-specific PRA to be completed on a time frame to support plant operation
  - Available for NRC audit prior to fuel load
  - License condition expected
  - Developed and maintained consistent with PRA standards in effect six months prior to COL issuance
- An updated plant-specific PRA is not necessary to support safety findings for COL*
  - Design PRA and COL Items suffice
  - Info to meaningfully update the design PRA may not be available until after COL issuance

*Except as required 1) to assess significance of plant-specific design differences on design PRA results, or 2) to support risk-informed changes/approaches

NEI

Plant-Specific PRA (cont.)

- New COLA requirement proposed in 2003 NOPR:

  "An application referencing a certified design must include [reference] a plant-specific PRA that uses the design-specific PRA and is updated to account for site-specific design information and ~~any~~ design changes."

- Recommend that Supplemental NOPR reflect post-COL completion of plant-specific PRA

NEI

Pre-COL Phase Activities

NEI 04-01, Section 5

- Provides general info to COL applicants (not detailed guidance)
  - Need to implement certain programs prior to COL
    - Design and Construction QA and Part 21
    - Construction FFD
    - Design Reliability Assurance Program
  - Expect Engineering Design Verification by NRC
  - Need for early ITAAC coordination w/NRC
  - Required records and reporting to NRC

NEI

Change Processes
NEI 04-01, Section 6

- Exemptions and departures from design certification (generic DCD) info
  - Tier 1, Tier 2, Tier 2*, Tech Specs
- Departures from ESP info
  - Safety (SSAR)
  - Environmental (ER)
  - Emergency Planning (SSAR)
- Post COL changes
  - Within the design certification scope
  - Outside the design certification scope

NEI

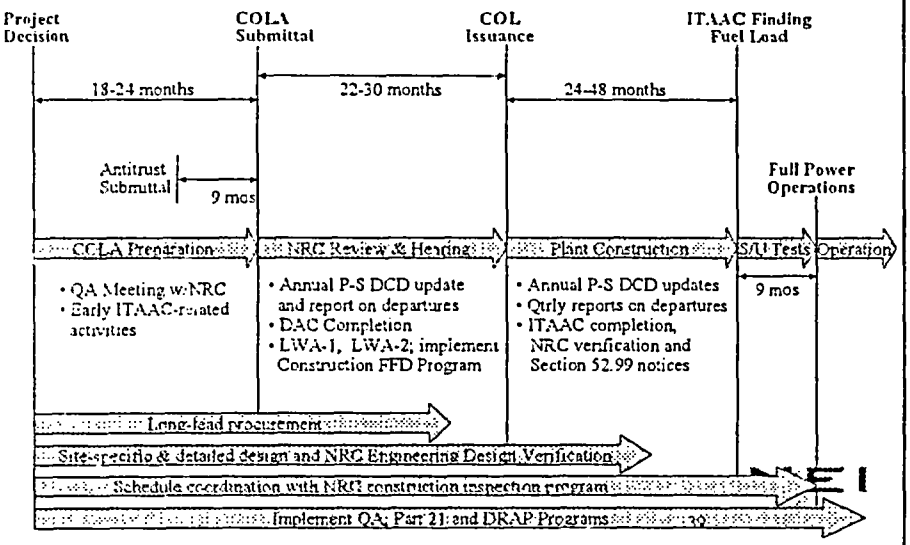
Other Topics

- Definitions – Section 2
- Nominal COL Timeline – Section 3
- Appendices
  - A. Acronyms
  - B. Part 52 Rule (later)
  - C. Overview of Part 52
  - D. COL Template
  - E. Sample FSAR Section 8.2
  - F. COL Application Outline for AP1000 (sample excerpt provided in NEI 04

NEI

Figure 3-1 – Overview and Timeline of COLA-Related Activities

This figure provides an overview of the COL process from project decision to plant operation. The figure depicts key milestones, concepts, processes and relationships discussed in NEI 04-01.



Section 3 – Overview and Timeline of COL Application Related Activities

This section consists of Figure 3-1, which provides an overview of the COL process from project decision to plant operation. The figure depicts key milestones, concepts, processes and relationships discussed in the guidance that follows.

Figure 3-1 – Overview And Timeline Of COL Application- Related Activities